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Marine samples taken by marine biologist are representative of the whole population. Some people who think they are and some that go against this statement. This topic is based on how the species of marine organisms are regulated due to the population. Sampling gives marine biologists a way to determine the amount of species in a population. Marine sampling techniques, the very definition of marine biology, the counter-argument, and the representation of samples all point to the fact that marine samples are effective.

Marine Biology is the study of the life in the oceans and other saltwater environments around the world. The studies include species such as plants, fish, marine mammals, sea birds, and microscopic animals. The scientific method should be used to find facts on the life forms in marine environments by conducting experiments and observations. The various sub-fields in marine biology are microbiology, environmental marine biology, deep-sea ecology, ichthyology, marine mammology, and marine ethology. (MarineBio) A goal of marine biology is to better understand how the ocean distributes the various organisms that live in it.

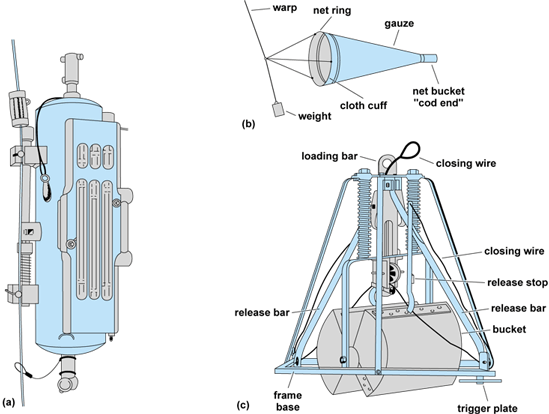
One of the most important reasons to study marine biology is the fact that the marine environments help to support life on earth. The marine life is a resource that not only helps to sustain life, but also is a vast resource that provides food, raw materials, and medicine for society. New technology has been made to research marine biology including trawling, ROV’s, fiber optics, satellites, sonar, and faster computers. There is much that can be learned about our marine environment and also much to be seen. There are even possibly new species that have yet to be discovered that biologists may discover in the future.

A primary goal of marine biology is to discover how the ocean controls the distribution of organisms. This goal can be accomplished by means of sampling the various populations for certain characteristics. Samples must be taken in order for biologists to determine whether a species is thriving or declining in their natural habitat. Assumptions on the dynamics of the ocean rest entirely on what is in the samples and what marine biologists can deduct form them. Traditional sampling techniques include bottle sampling, net sampling, and dredge sampling. (McGraw-Hill) These methods will cover the top, middle, and bottom zones of the ocean to capture the many species needed for the samples.

One example of laws enacted because of marine sampling, is the various size limits and creel limits for commercial and recreational fishing. These were created to lessen the overharvest of certain species of fish at different sizes. This means that you can only keep a certain number of the fish a day, and only above a certain size. So, if a recreational fisherman catches a fish that is too small, then it has to be returned to the water. Also if a commercial fisherman catches too many fish or fish that are too small, then they must as well be returned to the water. If they do not return the fish, then they could get fined. Marine sampling maintains equilibrium in the many fish populations by having these limits, so that the fish are not all removed from the ecosystem. Thus, the marine sampling keeps the fish at a sustainable level, as representative samples are taken to determine the status of the many marine organisms.

Many people are against the samples that marine biologists take. These people say that the samples are biased to end up putting more regulations on catchable species. This has always been a topic of interest for both marine biologists and fishermen. One example of this is that a marine law came into effect in 1987 that caused all shrimping vessels in the United States to use turtle excluder devices on their nets. A turtle excluder is a large hole in the net that a turtle can swim out of when it gets in the net. This law was disliked by many shrimpers because of the possible loss of shrimp and money to them. Later the Shrimp-Turtle Law was put into place, which required all countries that the US imported shrimp from, to use turtle excluding devices on their ships. (National Marine Fisheries Service) So many people were against this law and many other laws regarding the sampling of marine organisms.

Because samples are generally taken out of the eye of the observer, sampling effectiveness is often difficult to determine. Often, multiple observers are present, and many samples taken to increase the probability of correct sampling. For catching active fishes at various depths, it is essential to use large sized nets. For catching bottom dwelling organisms, it is essential to use grabs, dredges, or trawls to get them off the bottom. For catching very small zooplankton species, it is essential to use small nets or other capturing devices to contain them. These technologies have revolutionized how samples are taken, and how marine biologists are able to accurately tell approximate populations of marine species. These technologies make sampling much more efficient and easier to do, creating more samples that are representative of the entire population.



The sampling methods shown in the chart are used to take samples of a variety of marine organisms in the water. Figure A is used to find temperature readings in water, so that marine biologists can locate specific organisms they are trying to find. Figure B is used to catch zooplankton and other small creatures, without them being able to escape. Figure C is used to grab bottom dwelling organisms off the bottom. Catching these organisms with a net wouldn’t be possible, because they would slip under the net. (McGraw-Hill) These sampling techniques are used to get accurate samples of the certain types needed. There are generally certain types of organisms the marine biologists are looking for, so they use the certain sampling technique to be able to get the most samples possible.

The most important reason for sampling is to find the number of species in that given area. Certain types of marine organisms are threatened or endangered, so the marine biologists must monitor the populations of the species through the samples they take. If their samples are not accurate, they could show too little of the population of too much of the population. This would make their data inconclusive. Once the accurate samples are taken, they can be evaluated and marine biologist can determine whether a population is stable or not.

Marine biotechnology focuses in an area in the biomedical field, where scientists test drugs, and many of these come from marine organisms. Aquaculture, the farming of finfish, shellfish, and seaweeds, is another field that has been aided by marine biotechnology. Aquaculture is gaining importance in the country as consumer demand for fish and shellfish becomes greater than can be met by commercial fishing. This also helps to save some of the wild fish from being harvested and allows creates more accurate sampling data. Many researchers specialize the fields they are going to research for the marine biological field, such as going into aquaculture or marine biotechnology. ( Sea Grant) These specializations can be based on a particular species, organism, behavior, technique, or ecosystem, and create a need for sampling of the valuable marine species we have in the environment.

Marine biologists choose to sample certain populations to find out if they have the ability to sustain themselves. As different species of animal and fish come into the area during different times of the year, the sample may be skewed because of the lack of the species in the area at that time of the year. Marine biologists cannot just make a sample up from their past research. They must go out and take many samples and then record the results from those samples. These samples are only valid for that time period, because the population could greatly vary in just one year. For this reason, marine biologists have to retake samples constantly to continue to have valid data to prove their points.

Marine sampling is basically sampling marine organisms through different ways. Through this research, the sampling that the marine biologists get is then used to make laws to help preserve the species. The samples the biologists take are representative of the population of organisms.

Citations

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